Research Article

The Moderating Effect of Academic Stress on the Relationship between Self-esteem, Loneliness, Personality Traits, Academic Procrastination, and Suicidality among University Students in Jordan

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Health Psychology Research

Background

Several factors contribute to psychosocial disturbances among university students, which may lead to suicidality. There is a bidirectional relationship between academic and psychological well-being that warrants further investigation.

Objective

This study aims to examine the moderating effect of academic stress on the relationship between self-esteem, loneliness, personality traits, academic procrastination, and suicidality among university students in Jordan.

Methods

A convenience sample of 440 university students was recruited for a study employing a cross-sectional, correlational design. Participants completed an online self-administered questionnaire composed of six validated instruments, each assessing one of the following constructs: academic anxiety, loneliness, academic procrastination, personality dysfunction, self-esteem, and suicidality.

Results

The analysis showed that 25.0% of the students were at greater risk of suicide. Students demonstrated moderate levels of procrastination, moderate to high levels of self-esteem, moderate academic anxiety, low to moderate levels of global personality dysfunctions, and low to moderate levels of loneliness. Suicide risk was significantly and positively associated with procrastination, academic anxiety, loneliness, and overall personality dysfunction but not significantly associated with self-esteem. Academic stress had a significant moderating effect on the relationship between psychological factors and suicidality after controlling for demographic and personal characteristics ($F_{[23, 416]}$ = 7.52, p<0.001; R^2 = 0.306).

Conclusion

Suicide is a significant psychological problem among university students and can be exacerbated by academic and psychological-related factors. There is a pressing need to integrate screening and early detection programs for suicide risk and to establish professional psychological counseling services within academic institutions.

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1. INTRODUCTION

The health of young people is becoming a priority for mental health professionals at both national and international levels. In particular, university students are among the most vulnerable young populations to psychosocial disturbances and are at a higher risk of mental and psychological problems.[1-3] In Jordan, there are no national studies and records of suicide; however, the National Center for Forensic Medicine Jordan reported 166 suicide deaths in 2024, up from 160 cases in 2023. This has drawn attention to the factors contributing to the mental health deterioration of university students and highlighted the urgent need to ensure the provision of adequate and appropriate mental health services for young people. One of the most life-threatening situations that needs to be critically assessed and detected among young people is suicide. Globally, the World Health Organization (WHO) has announced that suicide is a public health issue and the fourth leading cause of death among individuals aged 15 – 29, with more than 700 deaths occurring annually due to suicide.[4] Although mental health and psychological counseling services are improving and increasingly available, suicide-contributing factors remain largely undefined, particularly in the Arab region, which lacks sufficient data compared to other parts of the world.[4] University students often avoid seeking mental and psychosocial services due to the fear of stigma rooted in cultural beliefs.[5] Culturally, suicide is socially disgraced.[6] However, younger people may be more willing to express their mental health concerns, such as anxiety, personality problems, and loneliness, when these issues are perceived as less socially and culturally taboo. Greater attention to these concerns may enhance our understanding of the link between suicidality and psychosocial disturbances. Detecting and identifying the psychosocial factors associated with suicidality could help in identifying those at high risk, even if they do not explicitly express their suicidal intention and ideation.

Previous reports have shown that psychological and social disturbances affect university students' ability to adapt to the demands of university life, including academic responsibilities and psychosocial and developmental changes.[7,8] Studies have also shown that a significant proportion of university-age students suffer from depression, anxiety, high levels of moral distress, psychological distress, substance use problems, and lack of social and community support.[1,9,10] University students face numerous social, academic, and life challenges, including the need to acquire skills related to innovative learning tools, information technology, and online education, which further contribute to psychological distress.[11] Managing both academic and psychosocial needs has been associated with increased academic and moral distress.[3,10]

One of the most neglected topics among university students is academic procrastination, which has been observed in a significant number of students.[12] Academic procrastination, defined as delaying the completion of assignments or postponing studying for examinations, is known to be extremely common globally and is projected to become even more prevalent.[13] It has been found to negatively affect students' performance, leading to course withdrawal, lower grades, and reduced satisfaction, which, in turn, contributes to increased anxiety and psychological burden.[3,12] This suggests that academic procrastination is a multidimensional and culturally sensitive factor. Moreover, personality traits have been proposed as influencing students' decisions to procrastinate, while others indicate that students' self-perception of their abilities may play a role.[13] Such contradictory findings regarding the link between academic procrastination and psychosocial well-being suggest that academic procrastination may be a potential risk factor for suicide and other psychosocial issues.

The above discussion implies that academic stress may either buffer or exacerbate psychosocial disturbances, thereby influencing suicidality among university students. The uncertainty surrounding academic stress and its connection to other psychosocial disturbances underscores the need for further investigation. Specifically, the role of academic stress as a moderating factor in the relationship between various psychosocial variables (such as personality problems, loneliness, academic procrastination, and self-esteem) and suicidality is a significant topic in mental health research. In light of the limited data on suicidality among young people in Arab countries, including Jordan, this study is particularly important. Therefore, the present study aims to examine the moderating role of academic stress on the relationship between self-esteem, loneliness, personality dysfunction, academic procrastination, and suicidality while controlling for sociodemographic characteristics among university students. We hypothesize that academic stress will buffer the relationship between these psychosocial factors and suicidality (Figure 1).

2. MATERIALS AND METHODS

2.1. DESIGN

This study utilized a cross-sectional, correlational design to assess the moderating effect of academic stress on the relationship between suicide and psychological factors, controlling for sociodemographic and personal factors. Data were collected using the online self-administered format from university students in Jordan.

2.2. SETTING

All academic institutions and universities in Jordan were targeted. This included students from both private and governmental universities, regardless of their geographical location.

2.3. SAMPLE AND SAMPLING

A convenience sampling technique was used to recruit students. Undergraduate students were invited to participate through a web-based questionnaire designed using Google Forms. Inclusion criteria included being formally enrolled in the academic year 2023 – 2024. Those who had experienced the recent significant loss of a family member or significant person within the past six months were excluded due to the potential overlap of mental health problems with the study variables. A total of 440 students completed the survey, constituting the sample for this study.

2.4. DATA COLLECTION

After obtaining ethical approval from the Ethics Committee of the School of Nursing at the University of Jordan (approval no. 19/2023/75 on November 19, 2023), data were collected from university students using an online self-report questionnaire (Google Forms).[13] The researchers used networks,
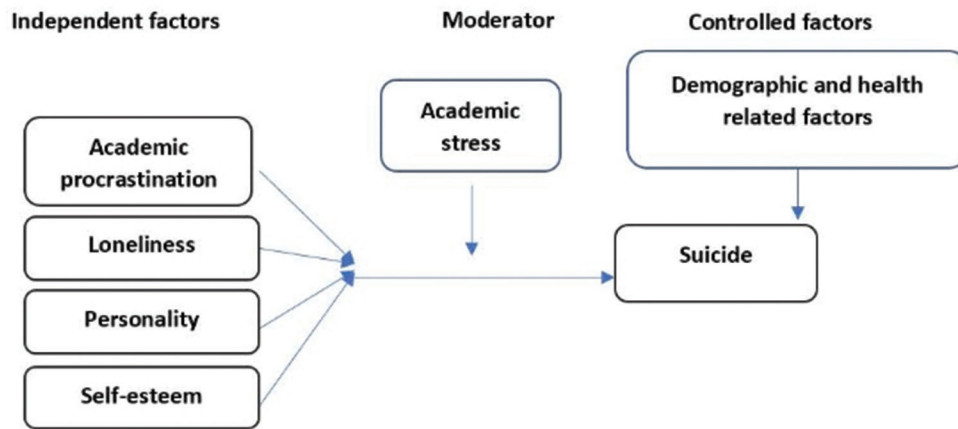
Figure 1. Moderating effect of academic stress on the relationship between psychological factors and suicidality, controlling for sociodemographic and health-related variables

social media, and personal contacts to reach potential participants. Interested students were asked to contact the research team and were provided with a link to the study form. The front page included a statement seeking informed consent. After electronically signing the consent form, participants were directed to the survey. Google Forms automatically saved all completed surveys. The survey took about 15 min to complete. All electronic data were stored on a password-protected computer.

2.5. INSTRUMENTS

Data were collected using an Arabic-language form in an online format. The WHO guidelines for translation and tool adaptation were followed, using the standard protocol of forward and backward translation. Pilot and face validity testing of the tools were conducted to address issues related to cultural and education system factors. The pilot study assessed cultural appropriateness, clarity of language, time needed, and the feasibility of accessing students. No changes to the translation were necessary, and the face validity positively appraised the translation. Students who participated in the pilot study were included in the final analysis. The tools used were:

(i) Academic stress was measured using the Arabic version of the Academic Stress Scale.[3,14] The original scale consists of two parts: self-efficacy and stress. This study used only the stress subscale. Students responded to 26 items (tasks) they encountered during university study, such as "writing term papers," "asking questions in class," and "managing both school and work." For each task, students rated how stressful it was on an 11-point Likert scale (0 = not at all stressful to 10 = extremely stressful). A second scale asked respondents to rate their confidence in successfully completing the same tasks (0 = not at all confident to 10 = extremely confident). Each scale includes four subscales: interaction at school, academic performance outside class, academic performance in class, and managing work, family, and school. The scale has good reliability, with a Cronbach's alpha of 0.90.[14] The Arabic version showed good internal consistency with Cronbach's $\alpha = 0.81$.[3]

(ii) Academic procrastination was measured using the General Academic Procrastination Scale.[15] It is a self-reported five-point Likert scale (extremely uncharacteristic = 1, moderately uncharacteristic = 2, Neutral = 3, moderately characteristic = 4, and extremely

characteristic = 5) comprising 20 statements. Ten items are reversed-keyed items: (3, 4, 6, 8, 11, 13, 14, 15, 18, and 20). Total scores range from 20 to 100. The scale has high reliability, with a Cronbach's alpha of 0.85. A higher score indicates greater academic procrastination. In this study, the scale demonstrated good internal consistency, with a Cronbach's alpha of 0.81.

(iii) Suicidality was measured using the Arabic version[17] of the Suicide Behaviors Questionnaire-Revised (SBQ-R).[17] The SBQ-R consists of four items that assess suicide risk by evaluating (i) lifetime suicidal ideation and attempts, (ii) frequency of ideation in the past 12 months, (iii) communication of suicidal thoughts to others, and (iv) likelihood of suicidal behavior in the future. The aggregate score ranges from 3 to 18, with higher scores reflecting greater suicide risk. A cutoff score of 8 or above indicates higher risk among adult psychiatric inpatients. Psychometric evaluation includes diverse participants such as college undergraduates, high school students, adolescents, and adults.[16] The SBQ-R demonstrates very good sensitivity (80%), specificity (91%), and internal consistency ($\alpha = 0.87$) for identifying suicidal individuals among adults with psychiatric disorders.[18] It takes approximately 5 min to complete. The Arabic version showed good internal consistency with Cronbach's $\alpha = 0.79$.[18]

(iv) Loneliness was measured using the Differential Loneliness Scale,[19] a research instrument comprising 60 true/false items, including positive items (which assess whether a particular provision is being offered and is reverse-coded) and negative items (which assess whether a specific provision is not being offered). The scale measures loneliness in four relationship domains: friendships, family relationships, romantic/sexual relationships, and relationships with larger groups or the community. A brief 20-item version (five items per subscale) of this scale is also widely used and was adopted in the current study. The full 60-item version has demonstrated excellent internal consistency (Cronbach's alpha >0.90).[19] In this study, the 20-item version demonstrated good internal consistency, with a Cronbach's alpha of 0.77.

(v) Personality traits were measured using the Personality Inventory for DSM-5 – Brief Form – Adult version,[20] a 25-item self-rated scale for adults aged 18 and older. It assesses five personality trait domains, including negative affect, detachment, antagonism, disinhibition, and psychoticism, each with five items. Each item is

rated on a 4-point scale (0 = Very false or often false; 1 = Sometimes or somewhat false; 2 = Sometimes or somewhat true; 3 = Very true or often true). In this study, the scale showed good internal consistency with Cronbach's alpha of 0.86.

(vi) Self-esteem was measured using the Rosenberg Self-Esteem Scale,[21] comprising 10 statements. Participants responded using a four-point Likert scale (strongly agree, agree, disagree, strongly disagree). Items 1, 2, 4, 6, and 7 were scored 3 (strongly agree) to 0 (strongly disagree), while items 3, 5, 8, 9, and 10 were reverse-scored. In this study, the scale demonstrated good internal consistency, with a Cronbach's alpha of 0.83.[21]

In addition, sociodemographic and personal information was collected, including age, sex, academic level, working status, academic performance, and experience. Health-related data such as psychiatric illness, physical illness, medication use, and general psychological and physical health were also collected.

2.6. DATA ANALYSIS

The data were analyzed using IBM SPSS Statistics version 28 for Windows. Descriptive statistics (means and standard deviations [SDs]) were used to describe sample characteristics, health-related variables, and psychological variables. The interquartile range was also used to describe the levels of psychological factors based on students' responses. Preliminary analyses were conducted to ensure no violations of the assumptions of normality, linearity, multicollinearity, or homoscedasticity. A $p < 0.05$ was considered statistically significant. First, to examine the relationships between suicidality, procrastination, loneliness, academic stress, self-esteem, and overall personality dysfunction, Pearson's correlation coefficient (r) was used. Then, to assess the moderating effect of academic stress on the relationship between suicidality and the domains of loneliness, academic procrastination, self-esteem, and personality dysfunction while controlling for demographic and personal characteristics (age, sex, working status, Grade Point Average [GPA], academic level, smoking status, presence of medical or psychiatric problems, use of psychotropic medication, and overall physical and psychological well-being), a three-step multiple hierarchical regression analysis was performed. In step one, demographic and personal characteristics were entered. In step two, psychological factors were added. In step three, academic stress was entered as the moderating variable. Suicidality served as the dependent variable in the model.

3. RESULTS

3.1. DEMOGRAPHIC CHARACTERISTICS

A total of 440 students completed the online survey. The analysis (Table 1) The mean age was 21.26 (SD = 3.19), ranging from 18 to 52, with a median age of 21. The mean GPA was 3.14 (SD = 0.47), ranging from 1.76 to 4.0, with a median of 3.15. In terms of gender, 65.9% ($n = 290$) were female and 34.1% ($n = 150$) were male. Regarding academic level, 21.6% ($n = 95$) were in their 1st year, 15.3% ($n = 67$) in the 2nd year, 22.1% ($n = 97$) in the 3rd year, 18.7% ($n = 82$) in the 4th year, and 22.3% ($n = 98$) were in the 5th year or above. In terms of employment status, the majority were non-workers (83.9%, $n = 369$), while 16.1% ($n = 71$) reported being employed.

Regarding smoking status, 22.5% ($n = 99$) were smokers. Among them, 30.3% ($n = 30$) smoked cigarettes, 24.2% ($n = 24$) used electronic cigarettes, 16.2% ($n = 16$) used a water pipe, and 29.3% ($n = 29$) reported using more than one type of smoking product. In addition, 86.4% ($n = 380$) chose their academic specialty willingly, 79.8% ($n = 351$) expressed a desire to pursue higher education, and only 5.9% ($n = 26$) reported receiving academic punishment during their studies. Regarding health conditions, 8.6% ($n = 38$) reported having a chronic illness, 10.0% ($n = 44$) had been diagnosed with a psychiatric illness, and 5.9% ($n = 26$) were taking psychiatric medications. When asked about their physical health status, 34.5% ($n = 152$) rated it as "excellent," 31.8% ($n = 140$) as "good," 15.9% ($n = 70$) as "fair," and 14.3% ($n = 63$) as "very good." A small percentage, 3.2% ($n = 14$), reported feeling "bad," one participant rated their physical health as "very bad." Mental health status among the participants was reported as follows: 4.3% ($n = 19$) rated their mental health as "very bad," 13.4% ($n = 59$) as "bad," 19.1% ($n = 84$) as "fair," 31.8% ($n = 140$) as "good," 23.6% ($n = 104$) as "very good," and 7.7% ($n = 34$) as "excellent."

3.2. SUICIDALITY AND PSYCHOLOGICAL VARIABLES

3.2.1. SUICIDALITY

The analysis showed that the total mean score for the suicidality scale was 5.53 (SD = 3.17), ranging from 3 to 16, with a median of 4.0. The interquartile equation indicated that 50.0% ($n = 220$) of students had scores between 3.0 and 8.0. Given that the possible score range is 3 – 18, the findings suggest a low to moderate risk of suicidality among students. In addition, 25.0% of the students scored 8.0 or above, indicating a greater risk of suicide (Table 2).

3.2.2. ACADEMIC PROCRASTINATION

The mean score for academic procrastination was 59.46 (SD = 8.81), ranging from 31 to 87, with a median of 60. The interquartile range showed that 50.0% of students scored between 55.0 and 64.0. Given the possible score range of 20 – 100, this reflects a moderate level of procrastination among the participants (Table 2).

3.2.3. ACADEMIC STRESS

The mean score for academic stress was 114.14 (SD = 60.40), with a median of 115.0 and scores ranging from 0 to 257. The interquartile range indicated that 50% of students scored between 62.0 and 162.2. Given that the expected score range is 20 – 200, these findings suggest a moderate level of academic stress (Table 2).

3.2.4. SELF-ESTEEM

The mean score for self-esteem was 18.51 (SD = 5.87), with a median of 18.0 and a range from 0 to 30. The interquartile range showed that 50% of students scored between 15.0 and 23.0. Given the scale's range, these results indicate a moderate to high level of self-esteem (Table 2).

3.2.5. PERSONALITY DYSFUNCTION

Participants exhibited varying degrees of personality dysfunction, with a mean total score of 36.14 (SD = 15.28), a

Table 1. Descriptive characteristics of the students (*n*=440)

Variable	*n*	(%)	M	SD	Med	Min	Max	Q₁	Q₃
Age	-	-	21.3	3.2	21.0	18.0	52.0	20.0	22.0
GPA	-	-	3.1	0.5	3.2	1.76	4.0	2.9	3.5
Sex									
Male	150	34.1	-	-	-	-	-	-	-
Female	290	65.9	-	-	-	-	-	-	-
Working status									
Yes	71	16.1	-	-	-	-	-	-	-
No	369	83.9	-	-	-	-	-	-	-
Smoking status									
Yes	99	22.5	-	-	-	-	-	-	-
No	341	77.5	-	-	-	-	-	-	-
Type of smoking product									
Cigarette	16	16.2	-	-	-	-	-	-	-
Electronic cigarette	30	30.3	-	-	-	-	-	-	-
Water-pipe	24	24.2	-	-	-	-	-	-	-
Mix	29	29.3	-	-	-	-	-	-	-
Academic level									
1st	95	21.6	-	-	-	-	-	-	-
2nd	67	15.3	-	-	-	-	-	-	-
3rd	97	22.1	-	-	-	-	-	-	-
4th	82	18.7	-	-	-	-	-	-	-
5th and above	98	22.3	-	-	-	-	-	-	-
Academic punishment									
Yes	26	5.9	-	-	-	-	-	-	-
No	414	94.1	-	-	-	-	-	-	-
Specialty choosing									
Yes	380	86.4	-	-	-	-	-	-	-
No	60	13.6	-	-	-	-	-	-	-
Higher education preference									
Yes	351	79.8	-	-	-	-	-	-	-
No	89	20.2	-	-	-	-	-	-	-
Chronic illness									
Yes	38	8.6	-	-	-	-	-	-	-
No	402	91.4	-	-	-	-	-	-	-
Psychiatric illness									
Yes	44	10.0	-	-	-	-	-	-	-
No	396	90.0	-	-	-	-	-	-	-
On psychiatric medication									
Yes	26	5.9	-	-	-	-	-	-	-
No	414	94.1	-	-	-	-	-	-	-
Sleep medication									
Yes	42	9.5	-	-	-	-	-	-	-
No	398	90.5	-	-	-	-	-	-	-
Physical health									
Very bad	1	0.2	-	-	-	-	-	-	-
Bad	14	3.2	-	-	-	-	-	-	-
Fair	70	15.9	-	-	-	-	-	-	-
Good	140	31.8	-	-	-	-	-	-	-
Very good	152	34.5	-	-	-	-	-	-	-
Excellent	63	14.3	-	-	-	-	-	-	-
Mental health									
Very bad	19	4.3	-	-	-	-	-	-	-
Bad	59	13.4	-	-	-	-	-	-	-
Fair	84	19.1	-	-	-	-	-	-	-
Good	140	31.8	-	-	-	-	-	-	-
Very good	104	23.6	-	-	-	-	-	-	-
Excellent	34	7.7	-	-	-	-	-	-	-

Notes: Q1: Quartile 1, percentile 25; Q3: Quartile 3, percentile 75.
Abbreviations: GPA: Grade Point Average; M: Mean; Max: Maximum; Med: Median; Min: Minimum; SD: Standard deviation.

Table 2. Descriptive statistics of the main variables of the study (*n*=440)

Variable	M	SD	Md	Min	Max	Q₁	Q₃
Suicide	5.53	3.17	4.0	3.0	16.0	3.0	8.0
Risk of suicide	1.29	0.46	1.0	1.0	2.0	1.0	2.0
Procrastination	59.46	8.81	60.0	31.0	87.0	55.0	64.0
Academic stress	114.14	60.40	115.0	0.0	257.0	62.0	162.8
Self esteem	18.51	5.87	18.0	0.0	30.0	15.0	23.0
Personality dysfunctions	36.14	15.28	34.5	5.0	105.0	26.0	43.0
Negative affect	8.87	4.19	9.0	0	33.0	6.0	11.0
Detachment	7.38	3.60	7.0	0	19.0	5.0	10.0
Antagonism	4.28	3.63	3.0	0	15.0	2.0	6.0
Disinhibition	7.74	6.09	7.0	0	47.0	4.0	10.0
Psychoticism	7.84	3.38	8.0	0	17.0	6.0	10.0
Loneliness	8.05	4.01	7.0	1.0	19.0	5.0	11.0
Romantic/relationship	2.58	1.37	3.0	0	5.0	2.0	3.0
Family relationship	1.37	1.51	1.0	0	5.0	0	2.0
Friendship	2.02	1.52	2.0	0	5.0	1.0	1.0
Other groups	2.10	1.06	2.0	0	5.0	3.0	3.0

median of 34.5, and a range from 5 to 75. The interquartile range indicated that 50% of students scored between 26.0 and 43.0. Given the scale's range of 0 – 75, this suggests a low to moderate level of overall personality dysfunction. Domain-specific analysis showed the following mean scores: negative affect = 8.87 (SD = 4.19), detachment = 7.38 (SD = 3.60), antagonism = 4.28 (SD = 3.63), disinhibition = 7.74 (SD = 6.09), and psychoticism = 7.84 (SD = 3.38) (Table 2).

3.2.6. LONELINESS

The mean score of loneliness was 8.05 (SD = 4.01), with a median of 7.0. The interquartile range indicated that 50% of students scored between 5.0 and 11. Given the possible score range of 0 – 20, this suggests a low to moderate level of loneliness. Subdomain analysis revealed the following mean scores: romantic relationships = 2.58 (SD = 1.37), family relationships = 1.37 (SD = 1.51), friendships = 2.02 (SD = 1.52), and other groups = 2.10 (SD = 1.06). Family relationships had the lowest mean score, while the other domains were relatively similar (Table 2).

3.3. BIVARIATE ANALYSES

3.3.1. RELATIONSHIP AMONG THE PSYCHOLOGICAL FACTORS

The analysis showed that suicidality among students was significantly and positively associated with procrastination (r = 0.21, $p<0.001$), academic stress (r = 0.50, $p<0.001$), loneliness (r = 0.26, $p<0.001$), and overall personality dysfunction (r = 0.10, $p<0.001$). However, no significant association was found with self-esteem (r = 0.03, $p>0.05$).

3.3.2. REGRESSION ANALYSIS

The results (Table 3) showed that Model 1, which included demographic and personal characteristics, explained 24.0% (R^2 = 0.24) of the variance in suicidality. Although the R^2 was relatively small, the model was significant ($F_{[11, 416]}$ = 11.62, $p<0.001$). In this model, the following were significant predictors of suicidality: overall perception of psychological well-being (b = −0.34, $p<0.001$), academic level (b = −0.13,

p=0.014), and GPA (b = −0.09, p=0.048). In Model 2, where all psychological factors were entered, the model remained significant ($F_{[22, 416]}$ = 7.59, p=0.001), with a significant increase in R^2 (R^2 = 0.298, R^2 change = 0.058, p=0.001). In this model, overall perception of psychological well-being remained a significant predictor of suicidality (b = −0.28, $p<0.001$). In addition, having a chronic illness (b = −0.10, p=0.027), loneliness related to romantic relationships (b = −0.11, p=0.023), and loneliness related to family relationships (b = 0.22, $p<0.001$) were also significant predictors in this model. In Model 3, where academic stress was added as a moderating factor, the model remained significant ($F_{[23, 416]}$ = 7.52, $p<0.001$), and the variance explained in suicidality further increased (R^2 = 0.306). The R^2 change of 0.008 was statistically significant (p=0.035), indicating that academic stress had a positive moderating effect on the relationship between psychological factors and suicidality, controlling for demographic and personal characteristics. In this model, the significant predictors of suicidality included overall perception of psychological well-being (b = −0.27, $p<0.001$), having a chronic illness (b = −0.11, p=0.009), loneliness related to romantic relationships (b = −0.11, p=0.024), and loneliness related to family relationships (b = 0.22, $p<0.001$), negative affect personality dysfunction (b = −0.11, p=0.043), and academic stress (b = 0.10, p=0.035). These results indicate that students with lower perceived psychological well-being, those with chronic illness, lower romantic relationship support, higher negative affect, and greater loneliness related to family relationships are more likely to have higher levels of suicide risk.

4. DISCUSSION

Studies addressing the mental health of university students indicate a significant sociocultural influence on their health and well-being. University students are struggling to manage their mental and psychosocial needs and feel overwhelmed by academic and social demands, which negatively affect their functioning.[21] This study addresses suicidality as a significant life-threatening condition and its connection to various psychosocial and academic factors. We found that a quarter of university students in this study are at high risk of suicidality, and a significant proportion are suffering

Table 3. Three-step hierarchical multiple regression analysis testing the moderating effect of academic stress on the relationship between suicidality and personality dysfunction, loneliness, self-esteem, and procrastination, while controlling for demographic and personal characteristics among university students in Jordan (n=440)

Variables	Model 1		Model 2		Model 3	
	β	p-value	β	p-value	β	p-value
Sex	0.013	0.791	0.013	0.795	0.101	0.920
Age	0.062	0.251	0.047	0.383	1.107	0.269
Academic level	−0.129	0.014*	−0.097	0.076	−1.900	0.058
GPA	−0.089	0.048*	−0.078	0.080	−1.770	0.078
Working status	0.085	0.082	0.089	0.065	1.914	0.056
Chronic illness	−0.070	0.120	−0.099	0.0278	−2.372	0.018
Psychiatric illness	−0.107	0.072	−0.097	0.099	−1.611	0.108
On psychotropic medication	−0.079	0.175	−0.084	0.150	−1.363	0.174
Smoking status	−0.033	0.484	−0.005	0.909	−0.240	0.811
Overall physical health	−0.022	0.679	0.014	0.790	0.447	0.655
Overall psychological health	−0.340	<0.001*	−0.281	<0.001*	−4.819	<0.001*
Loneliness related to romantic relationships	-	-	−0.111	0.023*	−2.261	0.024*
Loneliness related to family relationships	-	-	0.221	<0.001*	4.201	<0.001*
Loneliness related to friends	-	-	0.014	0.804	0.061	0.951
Loneliness related to other groups	-	-	−0.021	0.712	−0.396	0.692
Self-esteem	-	-	0.003	0.946	0.084	0.933
Academic procrastination	-	-	0.062	0.187	1.142	0.254
Negative affect personality dysfunction	-	-	−0.086	0.108	−2.034	0.043*
Detachment personality dysfunction	-	-	−0.018	0.737	−0.343	0.732
Antagonism personality dysfunction	-	-	−0.076	0.142	−1.164	0.245
Disinhibition personality dysfunction	-	-	0.053	0.360	1.055	0.292
Psychoticism personality dysfunction	-	-	0.084	0.116	1.602	0.110
Academic stress					2.110	0.035*
R^2	0.24	F=11.62	0.298	F=7.60	0.306	F=7.52
Adjusted R^2	0.219	<0.001*	0.258	<0.001*	0.265	0.001*
R^2 change	-	-	0.058	0.001*	0.008	0.035*

Note: *Indicates statistical significance at p<0.05.
Abbreviation: GPA: Grade point average.

from academic procrastination, academic stress, and loneliness. Students reported moderate to high self-esteem and mixed levels of personality dysfunction. We also found that academic stress had a significant moderating effect on the relationship between suicidality and several psychological factors. Overall perception of psychological well-being, being diagnosed with a chronic illness, feelings of loneliness related to romantic relationships, loneliness related to family relationships, and personality dysfunction were significant predictors of suicidality. However, academic procrastination, self-esteem, and other domains of personality and loneliness did not predict suicidality. The findings indicate that strong family and romantic relationships, along with a positive perception of mental well-being and the absence of chronic illness, serve as protective factors against suicidality among university students. This aligns with the dynamic interaction and communication within Arab families, which appear to provide a sense of mental security. In other words, the structure of Arab families, characterized by strong involvement and emotional ties with their adult children's psychosocial lives, may contribute to reduced suicidality. As mentioned earlier, adult children in Arab families typically maintain close and intimate relationships with their families. In particular, females remain under the close care, observation, and supervision of their families even after reaching university age if unmarried. This may explain why students reported lower levels of loneliness in family relationships compared to other relationships, such as with friends or broader social groups. These results are consistent with previous studies that found a significant moderating effect of academic stress on psychological and social factors influencing suicidality despite cultural and social differences.[22-25] The findings also support the broader literature highlighting the complex nature of suicidality and its multifaceted links with various psychosocial stressors.[26] This suggests that suicidality among university students can be detected through disturbances in other psychological areas that are less stigmatized and more readily assessed. Suicide is highly stigmatized and explicitly condemned in Islam, a religion practiced by nearly 95% of the population in Jordan and the Arab world. As a result, university students who report academic stress or issues related to loneliness and personality dysfunction, which are more culturally acceptable concerns, may in fact, be expressing underlying suicide risk. A novel finding of this study is that university students reported moderate to high levels of self-esteem and moderate levels of academic procrastination. This may seem counterintuitive, as one might expect low self-esteem and high procrastination among students at greater risk of suicidality. It appears that university students were more oriented toward social and personality issues than toward a broader understanding of suicidality. In other words, students perceived suicidality as a personal issue, with social and environmental factors having little influence on their perception, thinking, or ideation related to suicide.

Furthermore, the study provided a multifaceted perspective on suicidality among university students. While a

moderate level of procrastination highlights potential barriers to academic success, leading to higher academic anxiety, it is the effect of academic stress rather than procrastination that increases the risk of suicidality. Such findings have received little attention in the literature, and no previous studies have addressed the moderating effect of academic stress. Studies have suggested that psychological risk factors are significantly correlated with suicidality.[27] Despite this, no significant association was found between suicidality and self-esteem in our study, contrary to other studies reporting that lower self-esteem based on childhood trauma exposure was correlated with suicide ideation.[28]

The reported prevalence of chronic illnesses, smoking, psychiatric conditions, and medication usage is alarming. The overall physical and mental health status provides an overview of the perceived well-being of the study participants. The observed prevalence of various health status categories, particularly the approximately 20% reporting "very bad," "bad," or "fair" health among young students, suggests a concerning trend. Overall psychological well-being was found to be significantly correlated with suicidality, while overall physical well-being was not. These findings provide valuable insights into the health profile of university students and highlight the prevalence of mental health challenges within this demographic. It has been found that higher exposure to life challenges among students correlates with poorer physical and mental health.[29] This implies that physical and mental health challenges among university students may have a direct or indirect influence on academic performance and other psychological factors, including suicidality.[30]

One limitation of this study relates to using an online survey format, which makes it difficult to retrieve detailed health information about students and follow up with those at high risk of suicidality and psychological disturbances. The cross-sectional design also has some disadvantages, such as providing only a snapshot in time and susceptibility to confounding variables, selection bias, recall bias, social desirability bias, and missing data bias.

5. CONCLUSION

The study indicates that academic stress has a moderating effect on the relationship between certain psychosocial factors and suicidality among university students. The study has implications for mental health nursing and healthcare professionals. We found that a significant portion of university students are experiencing psychological and medical disturbances and that psychotropic medication use and smoking are also prevalent. Such findings suggest that mental health professionals in primary care settings, including universities, need to be aware of psychological factors that might be linked to more serious mental issues such as suicide. There is also a need for suicide screening tools and interventions in academic settings. Academics need to be educated and informed about the psychological difficulties students face and how to manage such disturbances. Students also need to be educated using various tools, including artificial intelligence applications, to enable them to seek early psychological counseling. There is a need to develop comprehensive support systems within universities that promote and enhance psychological counseling and mental health services on campuses. The findings underscore the complex interplay between academic anxiety, psychological health status, and suicidality, emphasizing the importance of targeted interventions to alleviate academic-related stressors and promote student mental well-being. This could be achieved through tailored interventions addressing academic stressors, interconnected psychosocial factors, and mitigating their impact on mental health outcomes among university students. Overall, these conclusions contribute to a deeper understanding of the health and mental health challenges confronting university students, considering cultural variations and their effects; notably, females differ significantly from males in such cultural contexts.

CONFLICT OF INTEREST

The authors declare no conflict of interest for the conduction, production, and publication of this study.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the Ethics Committee of the School of Nursing at the University of Jordan (approval no. 19/2023/75; date Nov 19, 2023). Informed consent was obtained from all individual participants included in the study.

CONSENT FOR PUBLICATION

Informed consent was obtained from all individual participants to publish their data.

DATA AVAILABILITY STATEMENT

Although data reported in this paper are not publicly available, the data will be available upon request from the corresponding author.

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